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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,482	12/04/2003	Kohji Andoh	2-2689	2109
2352	7590	02/08/2005	EXAMINER	
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			STEVENSON, ANDRE C	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,482

Applicant(s)

ANDOH ET AL.

Examiner

Andre' C. Stevenson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY

PRIMARY PATENT EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Detail Action

Objection to Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: In **figure #1**, there is no description for items 2 and 13 in the specification. Also, in figure 3a, there is no description for items 4 and 13. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tu et al. (U.S. Pat. No. 5,882,953, Patented 3/16/99, Filed 7/12/96), in view of Burr (U.S. Pat. No. 6,093,951, Patented 7/25/00, Filed 6/30/97).

Tu shows, with respect to **claim #1**, a method for preparing the junction-receiving surface of a semiconductive substrate of one conductivity type comprising (**Abstract; column 3, lines 1-6**): mapping the resistivity of a major surface of a semiconductive substrate by selectively measuring the resistivity of discrete locations on said major surface (**column 3, lines 51- 67; column 5, lines 26-41**). **Pertaining to Claim #4**, Tu also teaches the method further comprising a step of comparing the measured resistivity of each of said discrete locations to a reference value and determining desired counter-doping for each discrete location based on said comparison. (**column 3, lines 57-67; column 5, lines 35-41**). **Pertaining to claim #6**, Tu shows the method wherein said selective measurements are made by a non-contact probe (**Fig. 1a, column 3, lines 64-67; column 5, lines 35-41**). Tu also teaches, **pertaining to claim #7**, the method, wherein said semiconductive substrate is comprised of silicon (**column 3, lines 15-21**).

Tu fails to show, **pertaining to claim #1**, counter-doping said locations to increase their resistivity to a substantially uniform resistivity based on said mapping. Tu also fails to teach, **pertaining to claim #2**, wherein said counter doping is performed by implanting ions; **pertaining to Claim #3**, the method further comprising diffusing said ions to a desired depth; and, **pertaining to claim #8**, wherein said semiconductive substrate is doped with N type dopants and counter-doped with P type dopants.

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Burr teaches, in a similar process, wherein a silicon substrate is doped and counter-doped to form a junction, **with respect to claim #1**, counter-doping locations to increase their resistivity to a substantially uniform resistivity (**column 3, line 13-45**) based on mapping the resistivity (**column 3, line 47-60**). Burr also teaches, **pertaining to Claim #2**, wherein said counter-doping is performed by implanting ions (**column 5, line 17-26; column 14, line 42-50**). Pertaining to **Claim #3**, Burr teaches the method further comprising diffusing said ions to a desired depth (**column 13, line 13-19**). Also, **pertaining to Claim #8**, Burr teaches the method wherein said semiconductive substrate is doped with N type dopants and counter-doped with P type dopants (**column 5, line 32-36**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to additionally use the method of counter-doping said locations to increase their resistivity to a substantially uniform resistivity, based on said mapping, into the method of Tu, as taught by Burr, with the motivation given by Burr, in column 3 lines 40-45, that the resulting method produces an advantage of short channel asymmetric devices without the disadvantage of a high resistance conduction path, as well as produces a low threshold voltage (**column 7, line 43-57; column 3, line 13-44**) and, with the motivation that a technique for reducing the conduction path resistance is necessary if the potential advantages of counter doping are to be realized.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to additionally use the method of counter-doping performed by implanting ions, into the method of Tu, as taught by Burr, with the motivation given by Burr, in column 5

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lines 15-20, that the resulting method has the advantage of forming a pocket region under conditions such that it meets the criteria of a retrograde pocket region.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to additionally diffuse said ions to a desired depth, into the method of Tu, as taught by Burr, with the motivation given by Burr, in column 13 lines 15-19, that the resulting method has the advantage of sufficiently smoothing out the p-type dopant concentration over the well region to give it a relatively uniform and overall very light p-doping level.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to additionally use a substrate doped with N type dopants and counter-doped with P type dopants, into the method of Tu, as taught by Burr, with the motivation given by Burr, in column 5 lines 30-36, that the resulting method has the advantage of forming a PEFT device.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tu et al. (U.S. Pat. No. 5,882,953, Patented 3/16/99, Filed 7/12/96) in view of Burr (U.S. Pat. No. 6,093,951, Patented 7/25/00, Filed 6/30/97), and further in view of Ditzel et al. (Pub. No.:US 2004/0128631 A1, Pub. Date 07/01/04, Filed 12/31/02).

Tu, in view of Burr, substantially shows the method as claimed, and as shown, in the previous 35 USC 103(a) rejection of claims 1-4 and 6-8.

Tu, in view of Burr, fails to show, with respect to claim #5, wherein said method is executed by a software.

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Ditzel teaches, in a process wherein software is used to control a process to fabricate a doped junction device, **pertaining to claim 5**, a method of doping, which is executed by a software (**Page 2, paragraph 0021 and 0024**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the method executed by a software, as taught by Ditzel, in the method of Tu, in view of Burr, with the motivation given by Ditzel on **Page 2, paragraph 0021** that a computer software would not only give more accurate control over the doping process of a semiconductor device such as a transistor and "hardware only control", but also allow greater intelligent control over threshold voltages in the same.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure; Martenez-Tovar et al. (U.S. Pat. No. 6,199,484), Takeno et al. (U.S. Pat. No. 6,206,961), Henley et al. (U.S. Pat. No. 6,245,161), Sakeguchi et al. (U.S. Pat. No. 5,840,616).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre' Stevenson whose telephone number is (571) 272 1683. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:30 pm.

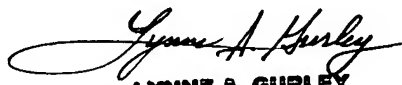
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272 1873. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956. Also, the proceeding numbers can be used to fax information through the Right Fax system;

(703) 872-9306

Andre' Stevenson

02/01/05


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812